

# CANYONS & CAVES

A Newsletter from the Resources Stewardship & Science Division

Issue No. 35

Winter 2004





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Look for Issues of *Canyons & Caves* at the following websites:  
<http://www.nps.gov/cave/pub-pdf.htm> Thanks to Kelly Thomas and Bridget Eisfeldt all issues can be downloaded as a PDF file from the park website.  
<http://www.caver.net/> Once there, go to the Canyons & Caves icon. Bill Bentley has placed all issues on his personal website and can also be downloaded as PDF files.

Address: 3225 National Parks Highway, Carlsbad, New Mexico 88220

**COVER PHOTO – Golf-ball sized cave pearls found in The Motherlode, Lechuguilla Cave. Photo © Dave Bunnell**

## RESOURCE NEWS

**RAINFALL FOR 2004** – The park headquarters area recorded 24.94 inches of rainfall for the year. Due to the large amount of rainfall, a number of canyons have had minor water flows across their beds for weeks if not for months. Water is very scarce under normal desert conditions. During some of the heavier rainfall events, portions of the park displayed beautiful cascading streams reminiscent of wetter mountainous areas.



Caught in a major downpour (with hail), Stan Allison snapped this picture in the park's backcountry on September 21, 2004. (Photo by Stan Allison)

**NEW CAVE** – One more cave has been documented in the park's backcountry bringing the total number of caves to 110.

**DECEMBER 23 SNOWFALL** – A late afternoon snowfall blanketed the headquarters area with about 6 inches of snow.



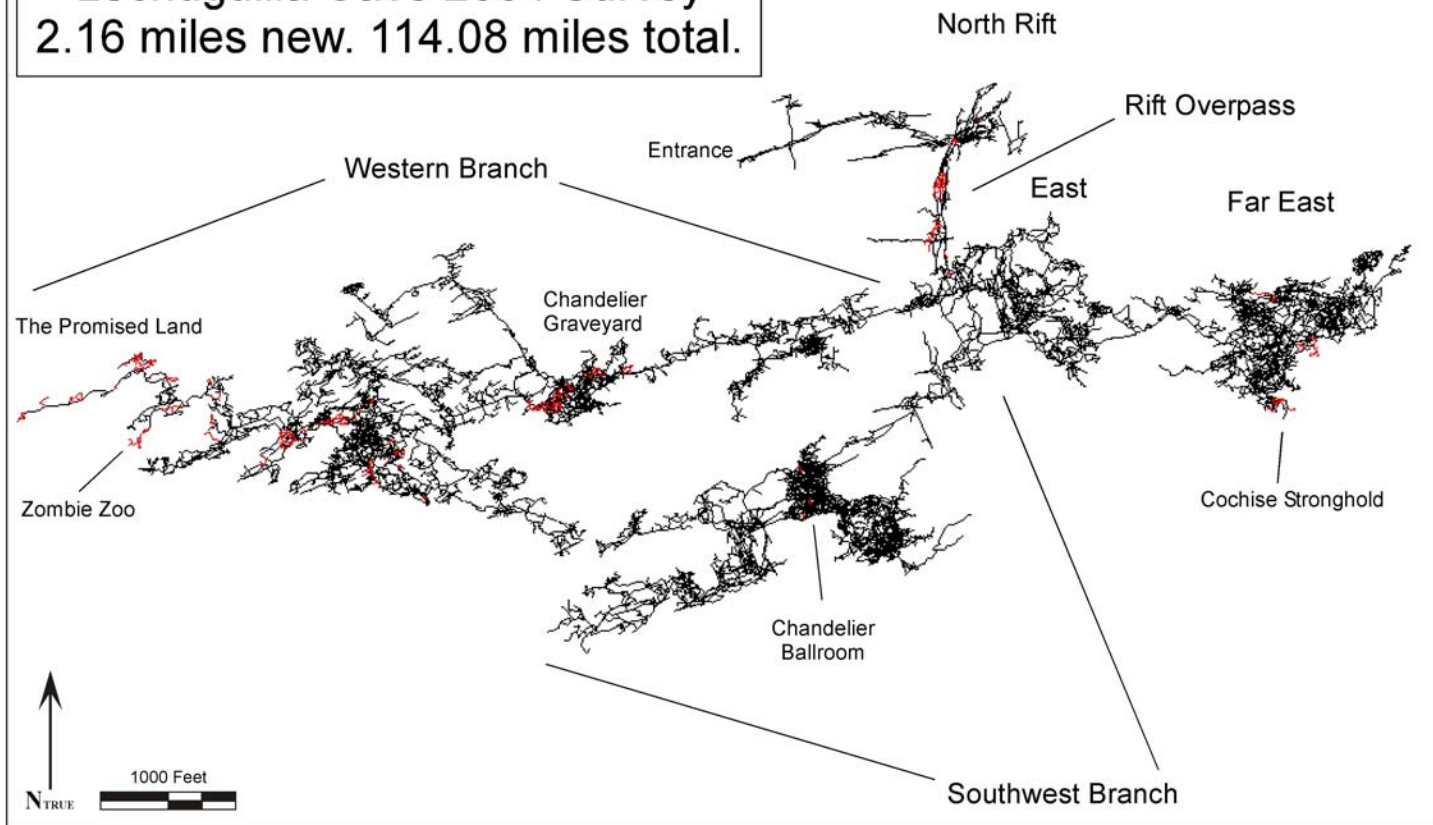
Snow beginning to accumulate in the entrance area of Carlsbad Cavern on December 23, 2004. (NPS Photo by Dale Pate)

## 2004 LECHUGUILLA CAVE SUMMARY *by Stan Allison*

No major breakthroughs were made in Lechuguilla Cave during 2004. As of January 2004, the surveyed length was 111.92 miles long. By December 2004, the survey had grown to 114.08 miles in length. Over 2.16 miles of new survey was performed and 0.87 miles of resurvey was done. The number of loop closures that exceeded 2 standard deviations (a standard indicator system we use to determine the quality of the survey) remained at 267 but the percentage of these bad loops dropped from 14.2% to 13.5%. The overall standard deviation for the cave survey improved from 1.264 to 1.204. Much work has been accomplished in the past five years in fixing bad survey loops. Almost half (133 loops) of the remaining bad survey loops are located in the Southwest Branch in the Voids/Chandelier Maze area. This area has an overall standard deviation of 1.417. Another area that could use some work is the Near East where there are only 47 bad surveys, but the standard deviation is 1.613 which is the worst of the 7 subdivisions in the survey data. All survey and resurveys done in Lechuguilla Cave are required to have an inventory done in conjunction with survey and resurvey.

Two major changes were made in the way survey data and survey notes are managed in 2004. Since the Carlsbad Caverns National Park Survey Standards were established, backsight and foresight azimuth and inclination information have been collected. In the past only the foresight azimuth and inclination were entered into the computer survey data. To achieve better accuracy, both backsight and foresight information are now being entered into all of the computer survey data. Another change is that we are now scanning all of the survey notes produced in Carlsbad Caverns National Park into Adobe Acrobat PDF files. Our goal is to eventually have all of the survey notes in the park in a digital format. This will make it much easier for researchers, surveyors, cartographers and explorers to utilize survey notes for their respective tasks in the future.

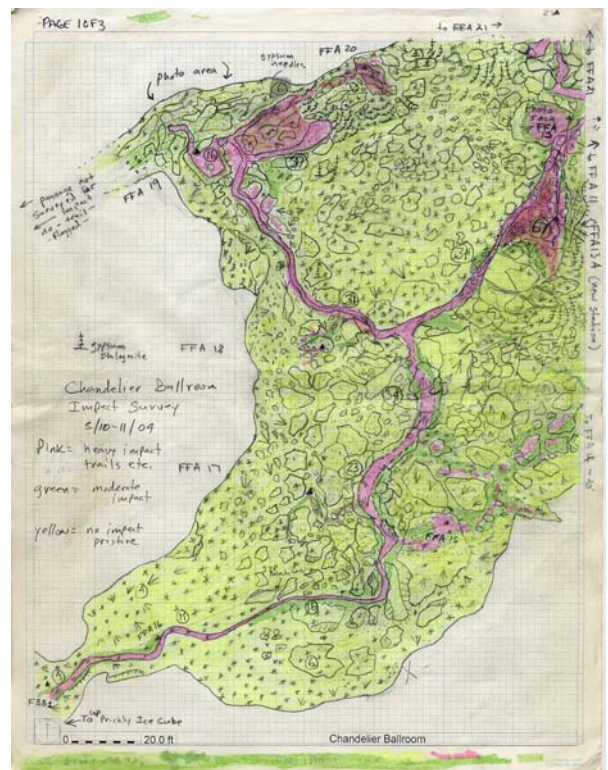
## Lechuguilla Cave 2004 Survey 2.16 miles new. 114.08 miles total.



Surveys done in 2004 shown in red. Map produced by Stan Allison using COMPASS and CANVAS software.

The first trip into Lechuguilla Cave for 2004 was on April 11 to replace the Big Sky Camp water source tube with a type of tube that would not support microbial growth. While in the Land of the Awes area, a survey tie-in blunder related to two survey stations with the same number (FFFB1) was corrected which fixed three of the worst survey loops in the area. This day trip was made by Andy Armstrong, Bonny Armstrong and Stan Allison.

Art Fortini and Ron Miller co-led a trip to the Promised Land on the dates April 30 to May 8. Trip participants were: Cathy Borer, Peter Bosted, Daniel Chailloux, John Lyles, Jed Mosenfelder and Carol Vesely. A total of 2,725.9 feet of new survey was produced during this trip. Most of the survey was completed in the Promised Land area with a minor amount in the Widowmaker area. Cathy Borer obtained corrosion residue samples for Diana Northup's research into the microbial activity of corrosion residue. Essentially all leads beyond the Nativity Chamber were explored and surveyed to an end on this trip. The Nativity Chamber and Promised Land area requires multiple gear changes to keep from tracking corrosion residue onto flowstone. With exploration essentially completed, traffic to this pristine area will be minimal. Thanks to all participants in the exploration of this area for their painstaking efforts to minimize their impacts while working there.



A scanned copy of one of the Chandelier Ballroom impact map sketches shows pink areas indicating heavy impact tended to align with the double lines indicating the flagged trails.



Ray Keeler led an impact mapping trip to the Chandelier Ballroom from May 9-12. Participants on the trip were Mark Andrich, Chris Beauchamp, Gary Burns, Jansen Cardy and Bob Jacobs. The purpose of this trip was to produce a detailed plan sketch at 20 feet to the inch of the Chandelier Ballroom indicating the visible human impacts in this room. Colors used on their sketch were pink to indicate heavy traffic, green to indicate moderate traffic, and yellow to indicate no visible impacts. The results of their impact map show that the flagged trails have been very effective in confining the majority of impact to the trails. The finished impact map for the Chandelier Ballroom will enable future park managers to see impact conditions to the room at the time the map was made. Future impact maps made of the same area will indicate whether the floor of the room continues to be more impacted over time or stays essentially the same as we see it today.

Hazel Barton led Dave Bunnell, Greg Francek, Vivian Loftin, Pat Seiser and Eric Weaver on a May 10-16 trip to continue work on her Chandelier Graveyard quadrangle maps. The expedition yielded 1,128.7 feet of new survey and 1,590 feet of resurvey. At survey station EYE26A17C, they photographed a dark green paste-like material on either white gypsum or calcite. This material seems to resemble a chromium compound that was previously only documented at survey station EJ11 by Harvey DuChene's mineral inventory. More work is needed to see if the two substances are indeed the same.



Chromium paste? at EYE26A17C. Photo © Dave Bunnell.

At the end of the Barton expedition, Stan Allison and John Lyles made a day trip to join Greg Francek and Dave Bunnell for a pre-approved photo trip to the Mother Lode area. For the chance to help document this amazing room, Dave graciously donated his images to the park files.

Jennifer Foote led John Lyles, Mike Flores and Phyllis Boneau on two day trips July 31 and August 1. They removed the old trail flagging from the cave entrance to Apricot Pit and replaced it with new trail flagging. They observed that the water in Lake Lechuguilla, a significant pool located in the upper portions of the cave close to the culvert, had risen from -0.1 feet in July 13 to 4.66 feet on August 1<sup>st</sup>. This was the first

of many interesting hydrologic observations made on what was an above average year for precipitation. The park headquarters received 24.5 inches of rain in 2004 which is more than twice the average precipitation of 12 inches for the area.



Greg Francek wearing aqua-socks in The Motherlode. Photo © Dave Bunnell.

Steve Reames coordinated 3 daytrips to work in the North Rift area to continue work on the quadrangle map he is drawing for this area. The first of these trips was taken on August 8 when Steve Reames, Bruce Albright and Barbara Smith resketched CHA9-25 in the Corinthian Leather Hall. During this same trip, Paul Burger belayed Stuart Marlett on a climb above CHA10 that did not go.

Simeon Warner led John Lyles, Steven Maynard and Jim Goetz on a trip to the Far East from August 14-21. They resketched the main room of the La Morada Maze and then spent the rest of the week working in the Outback. Survey was done in the Mescalero Room, Cochise Stronghold and other areas. A total of 1,430.7 feet of new survey was accomplished with 220.7 feet of resurvey.

On September 12, 14 and 16 Peter Jones and Aaron Addison co-led a series of day trips to the Rift and Rift Overpass. Trip participants were: Chris Andrews, Kelly Mathis, Travis Scott, Dan Legnini and Stan Allison. Though no major discoveries were made, a total of 1,779.5 feet of new survey was done along with 306.1 feet of resurvey. Surprisingly, there is still more to survey in the Rift and Rift Overpass area.

On September 24, Stan Allison, Pat Cicero and Aaron Stockton replaced all of the ropes in the Rift Overpass. They also fixed a blunder in the Rift Overpass area. Lake Lechuguilla was down to 3.27 feet.

On October 9 and 10 Stan Allison led a crew from the British Broadcasting Corporation (BBC) on a "recce" to plan for a high-definition video project to take place in November. Huw Cordey (producer), Paul Stewart (cameraman), and Justin Anderson (researcher) spent one night at Big Sky camp and visited the Pearlsian Gulf, Chandelier Ballroom, Prickly Ice

Cube Room, Hoodoo Hall and Land of Awes to prepare for the video project.



Stan Allison wearing aqua-socks and looking up into the large dome of The Motherlode. Photo © Dave Bunnell.

On October 10, Steve Reames led Amy and Carl Bern, Tom Dotter and Jeff Goben to continue work on in the North Rift area. Steve and Amy resketched and inventoried CHA25-33 and CHA25A-D while Tom, Carl and Jeff resurveyed in the CJA area.

On October 16, Stan Allison, Pat Cicero and Aaron Stockton made a day trip to the deep point of the cave at Lake of the White Roses (LWR) to download data from the water level data logger that was installed in May of 2003. The Lost Pecos River was no longer running and the pool which it normally feeds was lower than it had been in the past. Lake of the White Roses which is thought to be the regional water table has dropped 15 feet since its discovery in 1989. Placed into the cave during May 2003, records from the data logger showed a steady decline in the LWR pool level until early April 2004. During the period April 2-6, the park recorded 2.4 inches of rain at Carlsbad Cavern. A corresponding 0.1 foot rise of the LWR pool level occurred beginning about April 10 indicating a fairly rapid response from presumed flooding in Dark Canyon. Even more interesting, from September 20 to October 6, the park recorded 6.3 inches of rain during several different storm events that resulted in a rise of the LWR pool level of almost 1 foot beginning about September 25 and continuing to rise during the time the data logger was downloaded. It will be interesting to see how high the LWR pool level ultimately rises when the data is downloaded in the future.

On October 22, Paul Burger and Stan Allison removed up to a foot of sediment that had washed into the entrance tube of the airlock. A French drain was installed in front of the entrance to the airlock to allow sediment to drain away from the airlock in the future. Over an inch of water was present in the airlock. This water was bailed out and the airlock cleaned.

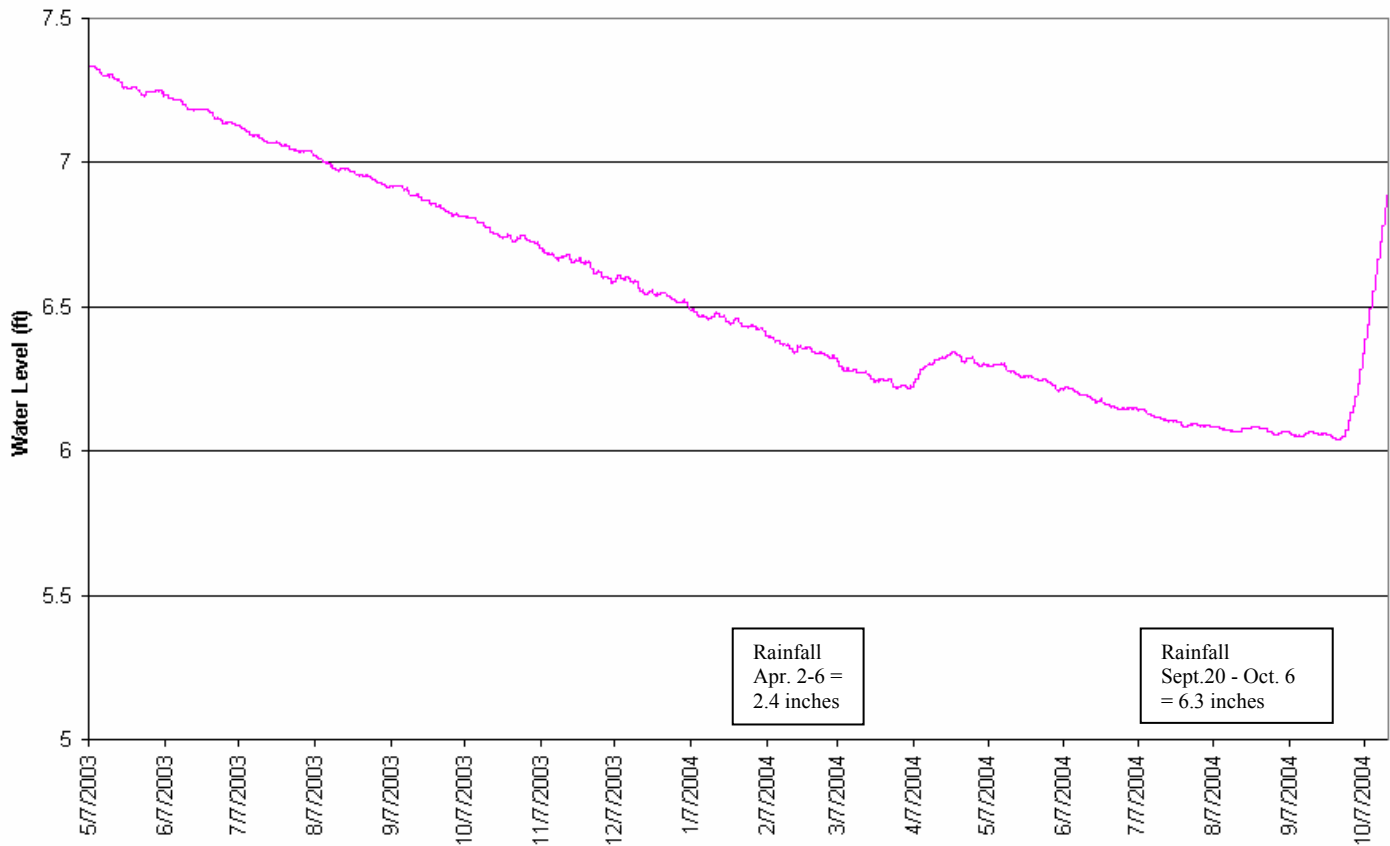
John Punches and Anmar Mirza led an effort to produce rescue pre-plans for the main travel routes in Lechuguilla Cave from October 25-29. Personnel involved were Tom Bemis, Nate Skelton, Scott Maxwell, Pat Seiser and Stan Allison. John and Anmar prepared notes for the pre-plan from the entrance to the bottom of Apricot Pit (beginning of the Eastern Branch) and the bottom of the Great White Way (beginning of the Southwest Branch) far exceeding the park's expectations. The pre-plan ideology involved minimizing equipment and personnel needed to increase the speed and efficiency and efficacy of a rescue, but also to reduce the impact of a rescue on the cave itself. Many of the haul systems call for counter-balance systems which reduce the amount of equipment and personnel needed. The counter-balance haul system was tested on Boulder Falls and worked quite well. This haul system can be operated with minimal equipment and with as few as five people. A Power-Point program was developed as a part of the pre-plan.

Peter Bosted and John Lyles co-led an expedition to the Western Borehole October 30 to November 6. The expedition had an International flavor with participants Daniel Chailloux from France, David Wools-Comb and Garry and Jenny Whitby from The Land Down Under (Australia). Matt Covington, Andy and Bonny Armstrong, Brian Kendrick, Jennifer Foote and Mark Andrich were also on the expedition. A total of 3,960 feet of new survey was accomplished with an additional 1,473 feet of resurvey done. Highlights of the trip include the discovery of about 700 feet of new cave to the south of Zanzibar in an area called the Zombie Zoo. Several leads were documented and surveyed in the Motherlode area including one called Anotherlode where the explorers ran out of rope in an unexplored, deep fissure with air. Work was also done in Paris, Texas and the Widowmaker area.

A cooperative high-definition digital video project between the BBC and the National Park Service (NPS) supported by volunteer cavers took place from November 9-19. The video crew spent ten days in the Big Sky Camp filming in the Southwest Branch. Support crews of cavers entered the cave each day bringing in video equipment, food, fresh batteries, and digital tapes and exited with spent batteries, full tapes, and etc. Film locations were approved ahead of time and were obtained at Lake Chandalar, LaBarge Borehole, Yellow Brick Road, Land of Awes, Chandelier Ballroom, Prickly Ice-cube Room, Hoodoo Hall and the Dilithium Crystal Pool. The BBC is producing an eleven part series titled Planet Earth for broadcast. One of the series will focus entirely on caves of the world, in which Lechuguilla Cave and Carlsbad Cavern will be featured. The BBC crew is scheduled to return in the spring of 2005 to film in Carlsbad Cavern. Once the program has aired, BBC will assign rights to the NPS for use of the footage. Look for the finished product to be aired in 2006.



## Lake of the White Roses



Water level data from Lake of the White Roses May 2003 to October 2004. Graph produced by Paul Burger.

Personnel on the trip were: Huw Cordey (producer), Paul Stewart (cameraman), Gavin Newman (lights and still images), Justin Anderson (researcher), Stan Allison (NPS representative). Many thanks goes to all of the support cavers who made this ambitious project possible: Pam and Tim Fogg, John Altingham, Andy Eavis, John Lyles, Bonny and Andy Armstrong, Mark Andrich, Gosia Allison-Kosior, Faith Watkins, Jean Krejca, Bev Shade, Wes Shumacher, Pat Cicero, Mike Flores, Phyllis Boneau, and Jennifer Foote.

On November 23, Paul Burger, Shannon Marcak and Rob Lorenz installed a water level data logger at Lake Lechuguilla to monitor its fluctuations. The water level at this trip was now above 7 feet which is the most it has been since it dried up in the mid 1990s.

The final trip of the year took place from December 19-22. Jim Werker led Val Hildreth-Werker, Merideth Hildreth, Dennis Hoburg and Mike Spilde on a research trip to collect samples at the far end of the Western Borehole. Samples were being collected for approved research projects by Penny Boston, Mike Spilde and Diana Northup.

Exploration and survey expedition proposals for 2005 were due by December 31, 2004. Permitted expeditions will hopefully be announced by February 2005.

## CHRISTMAS COUNT

by Renée West (with help from Steve West)

The Carlsbad Caverns Christmas Bird count has been conducted for 40 years, and you wouldn't think there would be many surprises left. But there still new species are to be found. Just last month, during the 2004 count on December 18, three species were added that had not been recorded on this count before: short-eared owl (4 individuals), eared grebe (2), and Cordilleran flycatcher (1).

"The Christmas Bird Count, born of a desire to count birds rather than shoot them during the holiday season, effectively gave birth to the modern conservation movement in North America in 1900," says *American Birds, The 104<sup>th</sup> Christmas Bird Count, 2003-2004*. New count circles are being added every year, giving people an opportunity to experience birding in many new places. This magazine, an overall compilation of the counts, is sent to all participants late each year.

The Christmas Bird Count has standard 15-mile-diameter 'count circles' (like the Caverns count circle) all over the Western Hemisphere, from Point Barrow, Alaska, to Drake Passage, Chile – from no sunshine to 24-hour sun. The highest species number of any count ever was from Mindo-Tandayapa, Ecuador, with 407 species in 2003. Any birder can volunteer to work on any count – just think of the exciting opportunities!

The eared grebes were seen at Washington Ranch, the flycatcher at Rattlesnake Springs, and the short-eared owls at Bottomless Lakes south of the park. Common poorwill, a nocturnal bird, was only spotted by one counter diligently staying out late and taking one last drive down Walnut Canyon entrance road. This same counter (Steve) also started at the Cavern entrance before dawn in another attempt to include cave swallows on this count, but to no avail.



This eared grebe and its companion were seen gracing a pond at Washington Ranch for the first time ever on the 2004 Cavern Christmas Bird Count. (Photo by Craig Cranston)

This year's other relatively rare sightings for winter included vermilion flycatcher, common poorwill, orange-crowned warbler, and phainopepla.



Also for the first time ever, a Cordilleran flycatcher was seen on the 2004 Cavern Christmas Bird Count. It was photographed at Rattlesnake Springs. (Photo by Craig Cranston)

The 2004 overall Caverns count totaled 91 species, matching the highest number of species ever on this count, and 2,819 individual birds.

White-crowned sparrow, one of our ubiquitous winter birds, scored the highest in this count with 515 individuals. Chipping sparrow was second with 134 birds. White-winged dove totaled 129, American robin 120, pine siskin 114, and the pink-sided form of the dark-eyed junco 103. Overall, 314 dark-eyed juncos were counted (5 forms and 'unknown form').

In many past years, the Caverns count has scored the highest number of sage thrashers of any count. In 2003, we topped every other U.S. count with 17 individuals. This time out, our counters found only five individual sage thrashers. But we could still be the highest when the entire 2004 count is compiled. It's still too early to know.

Other native birds from this year's count included 12 sandhill cranes, a belted kingfisher, 40 wild turkey (including the albino turkey still in the Rattlesnake Springs bunch), 21 individual hawks, seven great-horned owls, and four greater roadrunners. Also seen on the count were red-breasted and white-breasted nuthatches; Eastern, Western, and mountain bluebirds; four species of thrashers; orange-crowned and yellow-rumped warblers; six species of wrens; and 11 species of sparrows (see list). Both Eastern and Western meadowlarks were here too, including a flock of 18 Westerns bathing at Upper Lowe Spring, which has turned from a dried-up seep into a babbling brook with this year's high rainfall.

Three non-native species appeared on the 2004 Caverns count, mostly in the White's City area: Eurasian collared-dove (24), European starling (19), and house sparrow (31). Eurasian collared-dove was not even present in Eddy County six years ago. On a July 2000 trip to Louisiana, we drove over 100 miles out of our way to see one of these unusual birds. But now they have become quite common in Carlsbad and all over the Southwest. In fact, the annual high count in 2003 was Roswell, NM, with 938 individuals.

In all the Christmas Counts around the hemisphere, birds are counted within the circle over one entire day by as many people as wish to participate. The Caverns Count circle centers on Lowe Spring and includes land inside and outside the park, all the way from parts of Dark Canyon south to Bottomless Lakes. In 2004, 16 people participated, including seven employees of various Department of Interior agencies (two park Biology staff, two Exotic Plant team staff, one from the Bureau of Land Management, and two from the National Cave and Karst Research Institute).

Counters also keep track of mammals and other wildlife they see. This year's list included desert cottontail, rock squirrel, ground squirrels, coyote, raccoon, bobcat, javelina, and mule deer – as well as an unidentified snake. With so much rain this year and a nice day for the count, counters also enjoyed flowing seeps and streams, several types of flowers, and many butterflies.

#### THE 2004 CAVERNS CHRISTMAS BIRD COUNT

	Species	# individuals
1	Eared grebe	2
2	Great blue heron	1
3	Wood duck	14
4	Mallard	20
5	Green-winged teal	2
	Unknown teal species	3
6	Ring-necked duck	17
	Unknown duck species	3
7	Northern harrier	8
8	Sharp-shinned hawk	4
9	Cooper's hawk	1
10	Red-tailed hawk	14
	Unknown <i>Buteo</i> species	2
11	American kestrel	10
12	Wild turkey	40
13	Scaled quail	59
14	Sora	2
15	Common moorhen	1
16	American coot	23
17	Sandhill crane	12
18	Killdeer	15
19	Wilson's snipe	3
20	*Eurasian collared-dove	24
21	White-winged dove	129
22	Mourning dove	60
23	Greater roadrunner	4
24	Great horned owl	7
25	Short-eared owl	4
26	Common poorwill	1
27	Belted kingfisher	2
28	Red-naped sapsucker	1
29	Ladder-backed woodpecker	31
30	Northern flicker	16
31	Cordilleran flycatcher	1
32	Black phoebe	6
33	Eastern phoebe	7
34	Say's phoebe	16
35	Vermilion flycatcher	3
36	Loggerhead shrike	20
8		

37	Verdin	16
38	Juniper titmouse	5
39	Bushtit	7
40	Red-breasted nuthatch	6
41	White-breasted nuthatch	1
42	Cactus wren	3
43	Rock wren	66
44	Canyon wren	9
45	Bewick's wren	21
46	House wren	6
47	Marsh wren	6
48	Ruby-crowned kinglet	46
49	Blue-gray gnatcatcher	1
	Unknown gnatcatcher species	1
50	Eastern bluebird	59
51	Western bluebird	5
52	Mountain bluebird	6
53	Hermit thrush	11
54	American robin	120
55	Northern mockingbird	18
56	Sage thrasher	5
57	Brown thrasher	1
58	Curve-billed thrasher	2
59	Crissal thrasher	1
60	*European starling	19
61	American pipit	50
62	Cedar waxwing	28
63	Phainopepla	1
64	Orange-crowned warbler	1
65	Yellow-rumped (A) warbler	6
	Undifferentiated	4
66	Green-tailed towhee	29
67	Spotted towhee	54
68	Canyon towhee	10
69	Rufous-crowned sparrow	17
70	Chipping sparrow	134
71	Brewer's sparrow	12
72	Black-chinned sparrow	16
73	Vesper sparrow	5
74	Black-throated sparrow	44
75	Savannah sparrow	2
76	Fox sparrow	4
77	Song sparrow	20
78	Lincoln's sparrow	23
79	White-crowned sparrow	515
	Unknown sparrow species	68
80	Dark-eyed junco:	
	--slate-colored	37
	--Oregon	69
	--pink-sided	103
	--gray-headed	5
	--red-backed	2
	--unknown junco form	98
81	Northern cardinal	21
82	Pyrrhuloxia	35
83	Red-winged blackbird	15
84	Eastern meadowlark	1
85	Western meadowlark	19
	Unknown meadowlark sp.	53
86	Brewer's blackbird	23
87	House finch	43



88	Pine siskin	114
89	Lesser goldfinch	41
90	American goldfinch	35
	Unknown goldfinch species	2
91	*House sparrow	31
	Total	2,819

\* = non-native species

## 2004 SUMMARY OF SCIENCE IN THE CAVES OF CARLSBAD CAVERNS NATIONAL PARK

*by Paul Burger*

In 2004, there were 17 non-NPS research trips into the caves of Carlsbad Caverns National Park, encompassing 11 individual projects. These teams spent from 1 to 5 days underground collecting samples, documenting cave features, and establishing science stations. Additionally, each summer numerous trips are made to the entrance of Carlsbad Cavern and other park areas to capture and document the park's population of Cave Swallows. The projects are summarized below.

### CARLSBAD CAVERN

#### **Aeromicrobiology in Carlsbad Caverns**

*Diana Northup, University of New Mexico and Dale Griffith, USGS*

The purpose of this study is to use aeromicrobiology assays to profile the distribution of airborne microorganisms at various locations between the Natural Entrance and the Big Room and between the underground rest area and Lake of the Clouds in Carlsbad Cavern.

#### **Geographic Variation in the Echolocation Call Structure of Brazilian free-tailed bats, *Tadarida brasiliensis***

*Erin Gillan*

The purpose of this study is to determine the variation in the echolocation call structure of Brazilian free-tailed bats.

#### **Pool Fingers and Chenille Spar: Investigation of a possible Biological Origin**

*Diana Northup, Penny Boston, Michael Queen, Leslie Melim, Mike Spilde*

The purpose of this project is to investigate whether microorganisms help form pool fingers and chenille spar that frequently line cave pools.

#### **Late Pleistocene and Holocene Paleoclimatology from Speleothems**

*Victor Polyak, Yemane Asmerom*

The purpose of this study is to reconstruct the climate record for the Holocene and late Pleistocene for the southwestern US.

### **Late Holocene Climate Changes in the Southwestern United States**

*Jessica Rasmussen*

The purpose of this study is to collect cave drip waters for chemical analysis and monitor drip rates over the course of an El Niño event.

### **Survey of Cave Swallow Populations and Neotropical Migrants Using Park Areas**

*Steve West, Rick Wiedenmann*

The purpose of this study is to build up life tables for individual birds and monitor the health of the park's population of Cave Swallows.

### LECHUGUILLA AND SPIDER CAVE

#### **Spider Cave Moonmilk Study**

*Morgan Perrone*

The purpose of this study is to use stable isotope ratios and trace element biosignatures to examine biogenic structures in moonmilk.

#### **Terrestrial Biomarkers in Caves**

*Mike Spilde*

The purpose of this study is to identify geologic material that may serve as indicators (biomarkers) of microbiological activity that will aid in the search for microbiological life in meteorites and eventual geologic samples from Mars.

#### **Geomicrobiology of Lechuguilla and Spider Cave**

*Penny Boston, Diana Northup, Mike Spilde*

The purpose of this study is to determine the nature of microbiological communities within corrosion residue in Lechuguilla Cave and to discover the interactions between microbial communities and the rocks, minerals, and air of the cave.

#### **Geomicrobial Investigations of a Cave Deep Substrate Environment**

*Diana Northup, Penny Boston*

The purpose of this study is to investigate the possibility that the corrosion residues in Lechuguilla and Spider Caves are produced through the actions of microorganisms.

#### **Geology of Lechuguilla Cave and Related Caves**

*Arthur and Peggy Palmer*

The purpose of this study is to determine the geologic and geochemical controls on the origin and pattern of Lechuguilla Cave and other Guadalupe Caves.

### WITHIN ALL CAVES

#### **Vertebrate Species Use of Cave Resources in the Chihuahuan Desert**

*Tom Strong*

The purpose of this study is to document specific vertebrate animal use in caves of the Chihuahuan Desert, including park caves.

## 2004 SEARCH AND RESCUE HIGHLIGHTS

*by Tom Bemis*

A flurry of four cave rescues in southeastern New Mexico in 2003 and one in 2004 (none within Carlsbad Caverns National Park) resulted in a renewed reaching out between agencies and governmental bodies to combine resources in training and response for future Search and Rescue (SAR) emergencies.

During 2004, the park increased its cooperation with the Carlsbad Fire Department, area volunteer fire departments, Eddy and Lincoln Counties, New Mexico State Police, Lincoln National Forest (LNR), and the Bureau of Land Management (BLM) in training search and rescue personnel.

The park provided instructors for some of the courses and spread the word about the availability of other courses within the state.

Because of tight schedules and rapid employee turnovers within the park, interagency and intergovernmental cooperation in search and rescue has made it much easier to train and maintain a core of emergency responders familiar with the area and the specialized techniques and environmental sensitivities required for cave rescue.

Within the park, all cave rescue preplans have been re-evaluated, fine tuned, and in some cases, totally written or rewritten. These new plans reflect the higher levels of training and improved skills and equipment available for a rescue and should allow for safer rescues with less impact on the caves.

### PARK SUPPORTED SAR ACTIVITIES FOR 2004

**February 23-27** - Park SAR Training – this 40 hour course was a week-long high angle/cave rescue training refresher with 14 participants (12 from the park attended and 3 were instructors).

**April 18-19** – Trapped Caver Rescue – This successful rescue occurred on Lincoln National Forest when an entrance collapsed trapping a caver in a small cave. This was a 24 hour event where 30 individuals participate, 3 from the park, 1 of which was the Incident Commander.

**April 30-May 2** – ESCAPE – The State of New Mexico's Emergency Services Council's annual SAR training/conference. This was a 24 hour session. 1 from the park served as an instructor.

**June 5-6** – OCR – This was a Cave Rescue Seminar/Training session from the National Cave Rescue Commission. Six from the local community were participants including 2 from the park that were instructors.



Nate Skelton practices being a litter attendant on a SAR training session at Helen's Cave. (NPS Photo by Tom Bemis)

**June 19-26** – NCRC Seminar – This was an 8-day long seminar sponsored by the National Cave Rescue Commission where several different levels of training courses were offered. There were a 120 participants from across the US, 2 from the local area participated including 1 from the park.

**July 24-25** -High Guads SAR – Lincoln National Forest annually provides a weekend Cave Rescue session to participants of their High Guads Restoration Project. Eight participated and 1 from the park was an instructor.

**Aug. 14** – Field Coordinator Rendezvous – This is an annual conference held for all New Mexico State Police SAR field coordinators. One from the park attended.

**Sept. 25-26** – Incident Command System Section Chief Training – This is an annual training session by the New Mexico State Police for State SAR Coordinators. Eight people attended including 1 from the park.

**Nov. 15-16** - Overdue Hunter Search – This was a successful search for an overdue hunter on Lincoln National Forest. Eight people were involved including 1 from the park who served as the Incident Commander.

**Nov. 25-29** - Lechuguilla Cave Preplan – Cave Rescue preplanning for the upper reaches of Lechuguilla Cave was accomplished during this week from 5 individuals associated with the National Cave Rescue Commission and 2 from the park.